The
Aids to Navigation Bulletin

National Aids to Navigation School **Spring 2005**

National Aids to Navigation School
US Coast Guard Training Center, Yorktown, Virginia

AtoN systems of the United States and its territories are established, operated, and maintained by the Coast Guard to assist mariners in locating their position and to warn of nearby dangers and obstructions. This is done for the benefit of commercial vessels, recreational boaters, and to support the operations of the Armed Forces. Title 14 of the US Code makes this a responsibility of the Coast Guard.

The Bulletin is published to support the individuals and units involved in providing a reliable AtoN system for the mariner. The Bulletin seeks to meet the following objectives:

- To provide a means of circulating job skill information among AtoN technicians,
- To increase the professionalism and knowledge of all AtoN personnel,
- To act as a channel for information flow amidst the AtoN servicing units, District Office staffs, Headquarters staffs, and units, and
- To publish articles and photographs about people, units, or events which may be of general interest to the AtoN community.

To satisfy these objectives, it is necessary for all who read the Bulletin to take an active part in determining its contents. If you have found a "better way" or performed a unique evolution, share it with other people in the AtoN field. Submissions are welcome in any form. Articles and images may be submitted electronically to the editor via e-mail at abuffington@tcyorktown.uscg.mil or mailed to:

Editor, The AtoN Bulletin
National Aids to Navigation School
US Coast Guard Training Center
Yorktown, VA 23690-5000

Electronic submissions are preferred. Please keep photographs in original electronic form, and send them as separate files; do not imbed or copy them into word documents.

The articles contained herein are non-directive and non-record material. They are published for informational purposes only.

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NATON School Home Page

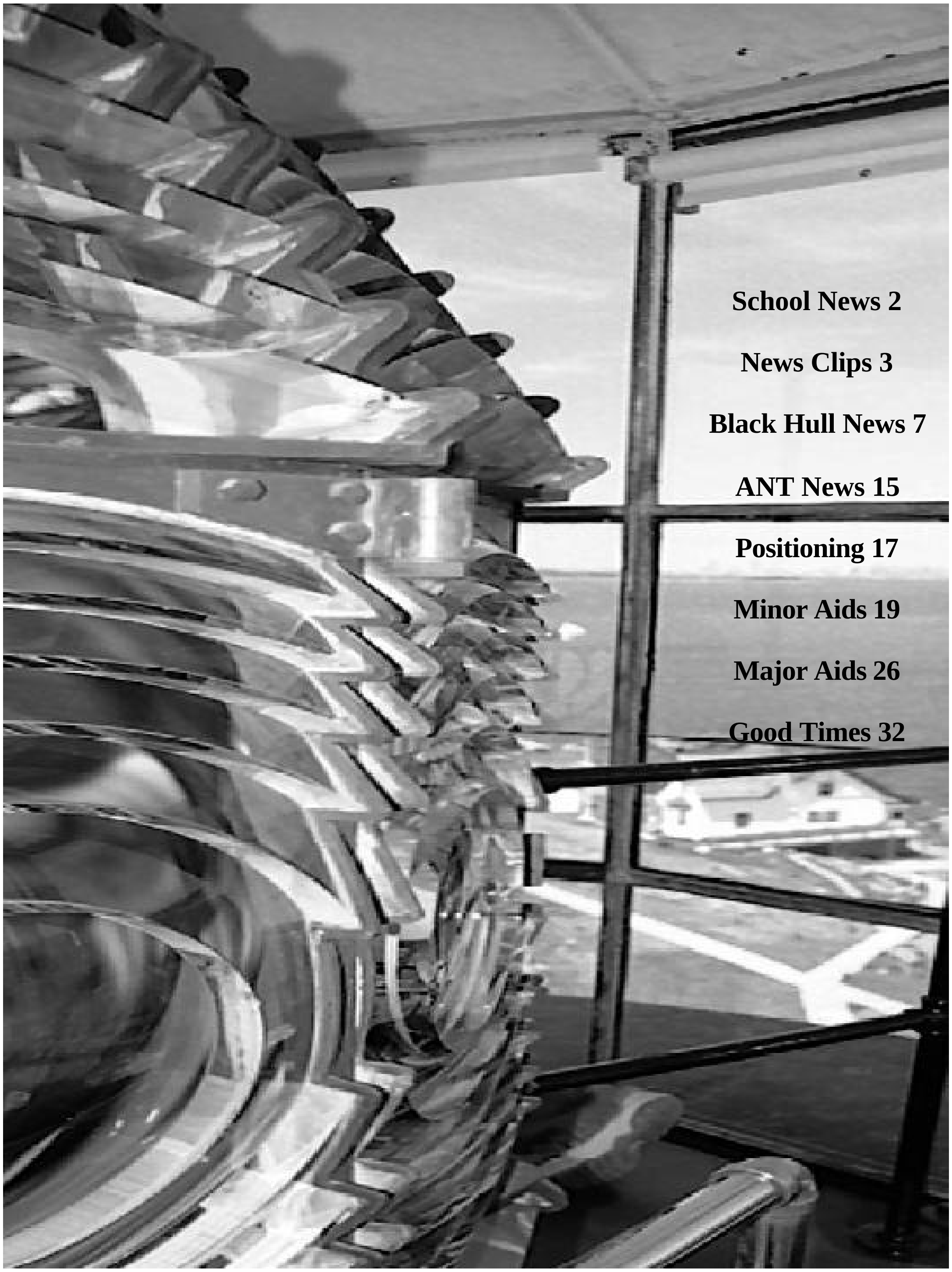
http://www.uscg.mil/tcyorktown/ops/naton/index.shtm

Deadlines for Articles:

Summer 2005 - 20 May
Fall 2005 - Phone Book
Winter 2006 - 15 November
Spring 2006 - 15 February

Volume 32, Number 3

On the Cover:
Buoy chain cut onboard USCGC ACACIA (WLB 406)
photo by PA1 Paul Roszkowski



Boston Light
photo by Brian Tague
www.braintague.com

Electronic Training Requests

by BMCM Mark Schweiger, NATON School

An Electronic Training Request (ETR) is required for all NATON classes.

Once again, an ETR is required for all NATON classes.

A request is only good for one class, and then it is deleted from the system. Unit training officers *must ensure* members meet prerequisites, which are listed on the TQC website at: www.uscg.mil/hq/tqc/natn.html. ETR's for non-qualified members waste everyone's time and clog up the system. Comments on the ETR will be very important to explain why you need a member trained (e.g. no one qualified at unit). Units must put the district and unit in the comment block first. Here is an example:

Comments: D11, USCGC WHITE BOAT Member in route to ANT Paradise as new XPO. Only prior AtoN experience is passing buoys in the channel. Training would set member up for success.

Districts Training Team Chiefs will still be in the loop via a spreadsheet NATON will send for input. So with that said, if a unit has a dire need for training, they need to communicate that to their District Training Teams so Districts can establish their priorities. We will cut orders for classes eight weeks in advance, so get those requests on file now, and don't wait until the last minute.

Here are some other useful links for your AtoN training needs:
TQC Home Page: www.uscg.mil/hq/tqc/
NATON School Web Site: www.uscg.mil/tcyorktown/ops/naton/index.shtm

And remember, an ETR is required for all NATON classes.

Congratulations to BM1 Lee McMillan on his recent promotion to First Class Boatswain's Mate

Upcoming NATON Course Offerings

Advanced Minor Aids Maintenance	18 April
Advanced Minor Aids Maintenance	27 June
Aids Positioning	6 June
Aids Positioning	18 July
AtoN Deck Supervisor	6 June
Auto Aids Lighthouse	25 July
Differential Broadcast Site Maintenance	4 April
Minor Aids Maintenance	11 April
Officer Advanced	25 April
Officer Advanced	9 May
Officer Basic	4 April
Officer Basic (date tentative)	2 May
Solar Power Lighthouse Technician	6 June
Solar Power Lighthouse Technician	9 May
Training Team Conference	5 April

Upcoming AtoN Meetings

D7 AtoN Conference	11 April
D17 Buoy Tender Roundup	8 August
West Coast AtoN Workshop	29 August
SOAC 2005	6 September

Air Station Sets a Buoy

D17 Photo Release

KODIAK, Alaska- A Jayhawk helicopter and its crew from Coast Guard Air Station Kodiak lift off from the airport in Cold Bay, Wednesday, with a small green buoy slung underneath. For the first time, the Coast Guard used a helicopter to set a buoy in water too shallow for a boat to enter. (Official U.S. Coast Guard photo courtesy Air Station Kodiak)

FIR Retrieves Two Adrift NOAA Buoys

by ENS Richard Chmielecki, USCGC FIR (WLB 214)

On December 14, FIR recovered the first of two NOAA weather buoys that broke free from their moorings during a severe ocean storm on the night of December 7. The storm produced powerful, 26-foot ocean swells that affected the coastline with extremely heavy surf and beach erosion. FIR was diverted from its LE patrol west of Newport, OR to retrieve the buoys before they washed ashore; if FIR had not recovered them in time, they would have likely been destroyed in the surf.

The coastal buoy weather reporting service is run by NOAA's National Data Buoy Center (NDBC) branch. NDBC provides NOAA forecasters with valuable meteorological data transmitted from dozens of offshore buoys. These buoys provide meteorological data that is essential to accurately forecasting the weather along the coasts of Oregon and Washington, and are valued at $250,000 each. Each buoy transmits information such as wave height, current, barometric pressure, water and air temperature, and wind data on an hourly basis. Members of the public can access this information at NDBC's website: www.ndbc.noaa.gov. The fishing industry and commercial freighters rely heavily on the data afforded by the coastal buoys to plan transits.

Buoys 46029 and 46050 are normally located 78 nautical miles southwest of Aberdeen, WA and 20 nautical miles west of Newport, OR, respectively. However, each buoy traveled hundreds of miles in swift ocean currents after being rendered adrift by the storm. Buoy 46029 was recovered approximately 20 nautical miles west of Grays Harbor, WA, and buoy 46050 traveled all the way to just west of Vancouver Island, British Columbia before it could be safely recovered. Although each buoy came close to running aground, steering currents remained favorable enough to keep them out at sea long enough to be safely retrieved.

FIR's buoy tending capabilities make it a popular asset for joint NDBC deployments; the ship has worked with NDBC on multiple buoy operations since June 2004. Despite moderate seas and difficult conditions during each of the recovery missions, FIR safely retrieved each buoy without any damage to the sensitive weather recording instruments. Once the buoys are outfitted with new moorings they will be relocated to their ocean stations and continue to provide essential data to forecasters.

First Heat and Beat

by LT Peter Niles, USCGC GEORGE COBB (WLM 564)

CWO Ben Brown, XO of GEORGE COBB, had never done a heat and beat, but he always razzed the crew about doing one (not smart). I told him to go down and show us how it was done. The BMC, being a loyal shipmate, told him everyone wears the pink hardhat for their first heat and beat. He did alright after the reheat, and the redeeming heat and beat the next day. It definitely raised morale and he was a good sailor for being involved after a couple long days underway.

even the hard days can be fun on a black hull

SEQUOIA Intercepts 39 Illegal Migrants

by ENS Soumangue Basse, USCGC SEQUOIA (WLB 215)

On July 29, SEQUOIA and crew were enroute Honolulu, HI on their maiden voyage to Guam. That immediately changed when the ship received tasking from District 11 (ole) to intercept a fishing vessel located 450-500 nautical miles southwest of Mexico. F/V PELANGI MELIA No.1 (Rainbow No.1) was suspected of smuggling 44 Chinese migrants to the United States.

After three days of searching, SEQUOIA intercepted and boarded the vessel. The boarding team verified that PELANGI MELIA No.1 was carrying 39 illegal Chinese migrants and a crew of five with intentions of smuggling them through Mexico to the United States. On August 3, USS CURTS rendezvoused with SEQUOIA to transport Coast Guard Pacific Area Law Enforcement Detachment Team 105 and Border Customs Immigration Service Agents to assist SEQUOIA with translating and providing security for the migrants. On August 8, EDISTO and GEORGE COBB reported on scene to relieve SEQUOIA, which moored in San Diego for repairs, replenishment of supplies, and rest after 20 days underway. SEQUOIA resumed her maiden voyage on August 12.

SEQUOIA was awarded her first Meritorious Unit Commendation for successfully interdicting PELANGI MELIA No.1 in spite of a limited number of boarding team members, fuel and food shortages, and sailing in a pre-commissioning status.






Champion of Versatility

by ENS Baxter Smoak, USCGC CYPRESS (WLB 210)

On December 1, CYPRESS was transiting outbound from Pensacola, Florida when a Blue Angel F/A-18 aircraft, a member of the Navy's elite Flight Demonstration Squadron, crashed into the Gulf of Mexico. The incident occurred during a routine training flight. The crash site was located three nautical miles south of Perdido Key, which is approximately 15 nautical miles southwest of Naval Air Station (NAS) Pensacola. The pilot ejected from the F/A-18 safely and was rescued within a half hour with only minor injuries. CYPRESS transited directly to the scene and arrived on site within hours of the crash. The ship first patrolled the crash site to pick up floating debris and secure the area for investigators. Over the next several days, CYPRESS maintained security in the vicinity of the downed aircraft. The days and evenings reeked of jet fuel as the ship patrolled the oil slick caused by the JP-8 that continued to bubble up from the Blue Angel aircraft, 42 feet beneath the ocean's surface. Using her installed sonar equipment, CYPRESS located the 28-million dollar jet on the seafloor. Typical of a buoy tender crew, talk began of a possible recovery operation. After three days on scene, CYPRESS was released and returned to her homeport in Mobile, AL.

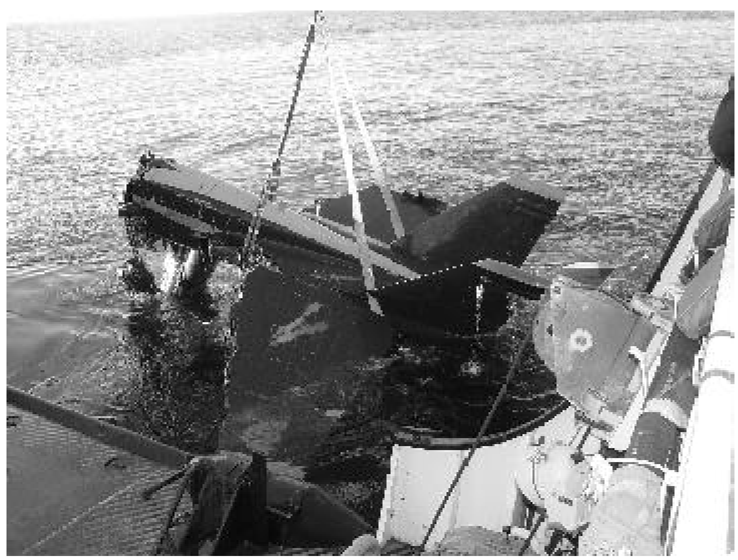
Due to CYPRESS's local knowledge of the area and expertise with heavy lifting at sea, the Navy requested their assistance in the recovery of the fallen aircraft. CYPRESS was assigned to cooperate with Navy Mobile Diving and Salvage Unit 2 (MDSU 2), from Naval Amphibious Base Little Creek, VA. 18 MDSU 2 divers and four enlisted Blue Angels support personnel deployed with CYPRESS on December 13. "This was quite a different operation than we're normally used to" said CYPRESS's First Lieutenant, CWO Michael Hoag. "We blended with the Blues and the MDSU 2 in a couple days, and I was amazed at how we became one crew."

In order to safely deploy divers and lift the flooded F/A-18, it was essential for CYPRESS to establish a virtually motionless platform over the crash site and maintain a lee for the divers. The ship developed a plan for executing a complex three-point mooring. The first step was setting a second-class yellow can buoy 75 yards south of the crash site, which CYPRESS later used to secure her stern. After setting the buoy, the ship came to a due north heading and dropped the port anchor 100 yards north of the crash site and veered three shots of chain, which put the starboard side directly off the wreckage. Then, the ship secured her stern to the yellow can, which pulled the cutter's stern to port and provided the divers protection from the elements coming from the WNW. The crew used a buoy mooring, with a 12,500-pound sinker, made off to the port chain stop to secure the ship even further. The solid mooring gave the divers a safe and stable platform to conduct their operations. On December 14, the divers made several three hour-long dives to bring up loose debris such as wing flaps, electronics, and landing gear. The divers loaded the debris into a basket on the seafloor and the ship brought it up with the inhaul winch and auxiliary crane fall.

On the morning of December 15, the elements had shifted to the NNE and CYPRESS's position was no longer providing a lee for the divers. The bridge team decided to shift to a four-point mooring. The ship thrusted to starboard, let go the starboard anchor, and veered three shots of chain, which set the ship directly over the crash site. Using the aft capstan, CYPRESS pulled its stern snug to the yellow can buoy so the port side was off the wreck site and the divers had an ideal lee. The deck force also shifted the 12,500-pound sinker to the starboard side. After the crew secured the ship with the sturdy four-point mooring, the divers made two more dives and the ship recovered the aircraft.

During the final two trips to the bottom, the divers ran two nylon straps under the belly of the aircraft. They placed one strap forward of the wings and one strap aft of them. In order to pass the straps under the plane, the divers were forced to dig trenches under it. They used water pressure from by the ship's firemain to dig the trenches. Then, the divers hooked the straps to a length of 1-½-inch chain. The inhaul winch took strain and lifted the aircraft inches off the seafloor while the divers remained on the bottom. The divers inspected the bridle to ensure it was rigged properly and would safely make it 50 feet up to the buoy deck. After it was apparent that the sling was rigged correctly, the ship recovered the divers. The dive equipment and divers were all relocated to safe locations while CYPRESS prepared for the critical lift.

A fully loaded Blue Angel F/A-18 Hornet weighs near 56,000 pounds and measures over 15 feet high and 56 feet long with a wingspan of 40 feet. Surprisingly, the divers reported that the shell of fallen aircraft was mostly intact, which is unusual in these operations. The divers estimated that the shell weighed about 16,000 pounds with a flooded weight close to 40,000 pounds, the maximum WLL of the crane. The deck force used the inhaul winch to bring the F/A-18 to 15 feet below the water's edge on the port side. Then, they set the chain into the stopper and reset the chain. The deck force hooked the main into the lift-



ing chain with a 25-ton shackle and lifted the jet to the buoy deck. When it came over the deck, the crew attached taglines to the plane and slowly positioned the massive load onto the buoy deck. The crane registered a maximum weight of 38,000 pounds when the wreck lifted out of the water.

After securing the load to the deck, CYPRESS transited inbound to NAS Pensacola where a Navy flat bed truck met the ship. The crew transferred the wreckage from the cutter to the truck. The evolution took several hours and was complicated by the narrow flat bed and darkness. The deck department loaded the small bits of debris into crates and moved them to the pier by crane. All hands were elated when the day was through; it was a job well done. The jet was relocated to a secure location on the Navy Base on the evening of December 16, where investigators were allowed to examine the wreckage. The cause of the accident remains under investigation.

“CYPRESS’s crew helped turn a potentially lengthy operation into a three-day evolution with precision navigation, highly professional seamanship, and flawless rigging” said MDSU 2’s Commanding Officer, CDR G. R. Allen. “This was a noteworthy feat and a testament to the readiness and willingness of CYPRESS’s crew to accomplish any task.” In completing its week of flight operations, CYPRESS did her part to continue the proud tradition of versatility of the buoy tender fleet.

Operating in Ice

by LTjg Zachary Ford and ENS Kent Stein, USCGC HOLLYHOCK (WLB 214)

HOLLYHOCK's fall buoy run was marked by inclement weather and early ice formation in several historically problematic areas. With air temperatures near zero and gale force winds, ice rapidly formed in the shallow freshwater bays of the Great Lakes, setting up a race against time. Ice presents a number of problems during AtoN operations. This article is intended to highlight some learning points, which may be useful to other units who encounter similar conditions. Contrary to popular opinion, the Juniper class WLB is very maneuverable in ice and most of its advantages over the Balsam class WLB (180') in open water can also be exploited during icebound AtoN operations.

On December 21, HOLLYHOCK arrived in Saginaw Bay, MI in the afternoon to decommission the 18 lighted buoys marking the 12-nautical mile long, 300-foot wide entrance channel. Two days earlier, a merchant vessel transiting at night reported seeing no lighted aids at all and very few buoys. We hadn't received any other information on the Bay's ice conditions while servicing aids throughout Lake Erie for the previous 10 days, and we began to fear that the bay had already frozen over. Our worst fears were confirmed when we reached the entrance to Inner Saginaw Bay and encountered 100% coverage of hard freshwater plate ice, six to eight inches thick, with pressure ridges exceeding two feet. While we were still about 12 nautical miles from the channel entrance, we observed numerous vessel tracks in the ice visually and by radar that were well off the designated shipping lane. With a combination of single digit temperatures, snow, and gale force winds forecast for the next several days, we faced several days of bad weather with almost $200,000 in AtoN hardware at risk. That evening, HOLLYHOCK recovered Lighted Buoys 13, 16, and 18 all between six and eight nautical miles northeast of AP before heaving to for the evening in rapidly shifting ice floes.

We needed a plan to quickly locate and retrieve the remaining 15 aids before the rapidly deteriorating weather claimed them permanently. Waiting out the weather was not an option, because of the increasingly urgent need to remove an additional 29 lighted buoys also at risk in southern Lake Huron and the Saint Clair River. We were convinced that we had an AtoN SAR case on our hands, so we called for the assistance of AIRSTA Detroit at first light on December 22. Using drift datum gathered from the first three buoys, we relayed the search areas to the HH-65. They miraculously located all 15 remaining lighted buoys scattered throughout the bay in under 2 hours through snow squalls that often reduced visibility to the point where the helicopter was not visible from the cutter as it flew overhead.

Over the next 36 hours, armed with this invaluable information on buoy locations provided by the helicopter, we worked diligently to rescue 12 of the remaining 15 aids from Old Man Winter. The steel 6X20 hulls held up well; unfortunately, the same cannot be said for the aids' lighting equipment – although Lighted Buoy 5's lampchanger (without a lantern) was working properly even though it was found underwater. All 18 light systems required replacement. External battery boxes were also more susceptible to flooding than the buoy body battery pockets.

Ultimately, a 150-degree wind shift and 6 inches of additional snow combined to submerge and then trap Lighted Buoys 6, 8, and 9 under the ice for the winter. Hopefully, diligent vent valve replacement and air test programs will bear fruit and the hulls will reappear this spring. In the end, we suffered almost $25,000 worth of ice damage in Saginaw Bay. Thankfully, the outstanding support received from AIRSTA Detroit and a Herculean effort from HOLLYHOCK's deck force prevented it from being eight times worse.

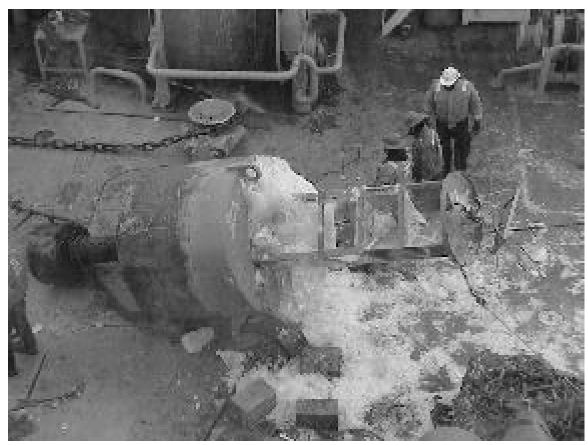
Lessons Learned

Prior to approaching a buoy in ice it is essential that the bridge team determine whether the ice is fast or moving. If the ice and the buoy are moving together, and the drift rate and direction are not desirable due to proximity of navigation hazards, a straight in approach, stemming the ice field movement is the best option. In drifting ice, if the buoy is merely bobbing in place, mostly upright and not being submerged, the cutter will usually be able to maintain station in the ice as well and it's possible (e.g. for depth of water reasons) to approach more perpendicular to ice movement. While approaching an aid in a channel, assume all nearby AtoN is submerged under the ice and pass it from the upwind direction whenever possible, which gives potentially submerged aids, although not visible, as much room as possible.

Approaching a buoy in a stationary ice field is not altogether different from approaching a buoy in open water. Wind direction and current can usually be ignored when considering the approach. Use of the Dynamic Positioning System (DPS) is not recommended due to very limited thruster capabilities and their complete inability to slide the ship sideways or alter the ship's head in ice more than a few inches thick. A straight in, very shallow approach, leaving the buoy as close as possible to the hull once alongside the buoy port and using the ice's resistance to maintain the ship's head and position worked well in most situations. If sufficient sea room existed and/or the aids lifting bales were ice covered, an initial high-speed pass close aboard followed by a sweeping turn around the aid often broke up a relief area surrounding it. Frequently, the buoy then rose out of the ice, exposing a clear lifting bale and the looser ice also allowed additional cutter maneuvering room. Relief passes in moving ice should be avoided since the track quickly closes, often submerging the buoy in the process.

Aid in Stationary ice

Working on a buoy deck in cold and icy conditions has its own set of challenges. Significantly more time was required to warm up and exercise buoy deck hydraulics, and buoy crane swing drive motors are particularly susceptible to freeze-up. Water intrusion in the swing drive's brake assembly can lead to freeze-up that may cause catastrophic failure of the drive housing if the crane is slewed in this condition. Both HOLLYHOCK and ALDER suffered swing drive motor casualties in December despite extensive efforts to prevent brake assembly freeze-up. Passing the cage line, clearing lifting bales, and getting the buoy to sit in a saddle on deck are much more difficult with heavy topside icing on the buoy. Reeving the buoy cage with a continuous round sling then using the inhaul winch to lift the buoy a few feet up and suck it into the buoy port often facilitated clearing the lifting bale and getting the hook in and moused. Chipping ice or using a sledgehammer worked much better than using a shotgun to clear ice from the bale. Liberal use of both sand and ice melt kept the buoy deck from becoming impassable. Portable kerosene heaters and keeping the deck crew inside until the aid is alongside also increased crew endurance in the bitter cold temperatures.



The fall buoy run proved a challenging and dynamic environment for conducting AtoN operations. This article covered only a portion of what we learned and is surely just the "tip of the iceberg" concerning this subject. While both AtoN and ice breaking are routine operations for HOLLYHOCK, constant vigilance and situational adaptation are necessities in overcoming conditions that make these operations anything but routine.

KUKUI Divers Help Construct Small Boat Pier

by LTjg Ian Brosnan, USCGC KUKUI (WLB 203)

ISC Honolulu recently added a new pier to their waterfront to accommodate the recently commissioned MSST 91107's six new SAFE boats. The new pier has an aluminum structure and plastic flotation and is permanently attached to the concrete breakwall near the small boat station. It extends outward approximately 20 feet where flexible cables anchor it to two 5,000-pound sinkers resting in 25 feet of water. In-house teams at ISC Honolulu attached the pier to the breakwall; however, anchoring this type pier to the bottom would normally require the Coast Guard to contract out to divers in the private sector at a cost of about $2,500 a day. Fortunately, this kind of work is well within the capabilities of Coast Guard divers, and there are two available dive teams here in Honolulu. KUKUI and WALNUT each have a team and a third dive team is starting up at the MSST.

Once the pier was placed in the water and attached to the breakwall, KUKUI's divers went to work. KUKUI is moored about 200 feet from the new pier, so the sinkers were delivered to KUKUI where our deck force used the ships crane to hold the first 5,000 pound sinker in the water column. Once the sinker was in the water, divers attached a lift-bag to the sinker and inflated it to take the weight before releasing the crane hook. One the lift-bag/sinker was floating freely next to the ship, we needed to move them towards the pier. In retrospect, it would have been easier to tow the liftbag/sinker combination to the pier with a small boat, but the wind was blowing in our favor so we simply pushed them into place ourselves. Once in the proper position, we attached the mooring lines to the pier and sinker and cut the liftbag free, which allowed the sinker to drop in place. We repeated this process for the second sinker and returned several days later to increase the tension on the lines that secure the pier to the sinkers. To date, the pier remains operational, allowing MSST 91107 to keep their boats in the water and ready to respond to a marine incident.

In addition to servicing AtoN, divers from the KUKUI and WALNUT frequently provide underwater ships husbandry service to visiting cutters and the 378's and 110's homeported in Honolulu, and perform other dive-related tasks in the Pacific as requested. For more information on Coast Guard diving, please visit the Coast Guard Diving website at www.uscg.mil/hq/g-o/CGDiving/Home.htm or KUKUI's Dive Team webpage at www.uscg.mil/d14/units/kukui/divepage.htm.

BLUEBELL Celebrates 60th Birthday

by CWO Eric Olson, USCGC BLUEBELL (WLI 313)

On April 4, BLUEBELL marked 60 years since her commissioning in 1945.

BLUEBELL is a 100-foot long, 225-ton Inland Buoy Tender constructed by Birchfield Boiler Company in Tacoma, WA in 1944. BLUEBELL is unique as the only vessel in the WLI-100 A-class.

BLUEBELL was originally homeported in Vancouver, WA and then moved to her present moorings at Coast Guard Group Portland, OR in 1973. She is responsible for maintaining approximately 420 aids to navigation, both buoys and beacons. BLUEBELL's area of responsibility extends from the mouth of the Columbia River up to Kennewick, WA including the Willamette River and up the Snake River to Lewiston, ID. This area covers approximately 500 river miles and passes through eight sets of locks and dams rising 738 feet above sea level, making BLUEBELL the highest altitude buoy tender in the Coast Guard. Climate varies from the lush, wet coastal climate to the barren, dry high desert.

With a crew made up of one officer and 14 enlisted men, BLUEBELL provides a real bang for the taxpayer's buck. BLUEBELL ranks as one of the three oldest black-hull cutters and one of the six oldest ships in the Coast Guard. In her excellent condition, chances are good she will one-day sport the gold hull numbers.

Station/Aids to Navigation Team Muskegon

by BM1 Michael Tapp, Station Muskegon

Muskegon is located approximately one-third of the way up Lake Michigan's east coast. Station Muskegon's AOR consists of six inland lakes along a 23-mile stretch of Lake Michigan's coastline. The current Coast Guard facilities in Muskegon were previously home to Search and Rescue Detachment (SARDET) Muskegon, staffed seasonally by members of Station Grand Haven. In August 2000, ANT Grand Haven was permanently moved to Muskegon to share the facilities with the SARDET. In the spring of 2001, ANT Muskegon absorbed SARDET Muskegon and became Station Muskegon. In the fall of 2003, the station finished a base-wide, yearlong rehabilitation of the station and grounds. A brand new galley/recreation deck, an AtoN garage/shop, three new offices, and a new watch room were added to the facilities. Station Muskegon is currently one of only six stations in the Coast Guard with both AtoN and SAR responsibilities. The SAR sections work a port and starboard rotation, with four-person boat crews. The AtoN crew day works and stands port and starboard pager duty for discrepancy response. Station Muskegon currently has no berthing rooms; all crews are authorized to live on the economy.

The Station/Aids to Navigation Team (STANT) concept has worked well for Station Muskegon, largely due to the dedication of the crews. It is not uncommon for a boat crew to spend a week working AtoN throughout the West Michigan area and then get recalled over the weekend to fix an engineering problem on the SAR boat. Likewise, a crew assigned to the SAR rotation will often find themselves off-loading buoys when the BUSL returns from a trip, or painting aids to get them ready for the spring commissioning.

Station Muskegon's normal workload includes 115 seasonal floating aids, of which 28 are lighted. Due to the ice conditions during the winter months, 103 of the 115 floating aids are decommissioned each fall and then commissioned again in the spring. The Station also maintains 48 minor lighted structures and 12 lighthouses, as well as servicing seven industrial and nine recreational ports covering 200 nautical miles of Lake Michigan's coastline. During FY-04, Station Muskegon responded to 79 SAR cases and 381 recreational boating safety boardings. As a result of our close relationship with local law enforcement agencies, it is not uncommon for the duty crews to conduct joint law enforcement patrols and SAR with the Department of Natural Resources and the local Sheriff's Department. Our resources include a 49-foot BUSL, a 27-foot UTM manufactured by SAFE Boat, a 23-foot TANB, and a 16-foot skiff. 19 active duty and 5 reserve personnel are trusted to care for these assets, the grounds, and the missions.

Station/Aids to Navigation Team Lorain

by BM1 Robert Sanchez, Station Lorain

Welcome to Station Lorain, OH, located 30 miles west of Cleveland on the shores of Lake Erie. We are a Ninth District Station/Aids to Navigation Team (STANT). This unit was established in June 2000 when ANT Huron was disestablished and moved its boats and some personnel to Station Small Lorain. Once the ANT OIC billet was relocated to Lorain, the station became an independent unit for the first time in three years.

Station Lorain is truly a multi-mission unit. The boating season is generally April through November, weather pending. During the 2004 season, the Station responded to 112 SAR cases, 254 assists, saved $1,841,000.00 in property, conducted 150 boardings, and maintained 140 aids to navigation. With 25 assigned billets, personnel have a chance to learn both sides of the AtoN/small-boat house.

The primary AtoN resources are a 21-foot TANB and a 16-foot work punt with a 25 horsepower outboard for shallow water operations. Our AtoN AOR runs from the east side of Cleveland at Gordon Park west to Ward Canal in Toledo. About half of the aids are lights – including four lighthouses (no Fresnel lenses) – and 90% of the buoys are sixth-class hulls marking shallow channels for recreational boaters. Freighters moving grain, coal, and iron ore are also common in the area.

For SAR, we utilize a 30-foot UTB and a 23-foot RHB. Lake Erie has a huge number of registered recreational boats and with the northern climate our boating season falls between Memorial Day and Labor Day. Late season walleye fishing and duck hunting are the norm in late fall. We are also outfitted for near shore ice rescue but are not a designated ice rescue station.

Keeping all missions fully manned is challenging with only 17 rated billets. Currently we run a five-person AtoN crew: BM1, MK2, BM3, and 2 EM3s. The rest of the crew works a traditional port and starboard duty rotation.

The best time to be in Northern Ohio is the summer with all of the boating activities. Cedar Point Amusement Park is in nearby Sandusky and the Lake Erie Islands are a very big attraction off of Port Clinton. To the east, Cleveland has many professional sports teams, museums, the Rock and Roll Hall of Fame, and lots jazz clubs and nightclubs.

I-ATONIS and AAPS 5.0 Deployment Update

by Ms. Marie Sudik, NAVCEN

I know we've been talking about I-ATONIS and AAPS 5.0 for a loooonnngggg time – but there is really (really) light at the end of the tunnel.

I-ATONIS has become a stable product – ready for day-to-day use. Therefore, deployment activities have begun in earnest:

- NATON conducted I-ATONIS training for the district oan staffs.
- oan staffs were well prepared for the training since they have been diligently experimenting with I-ATONIS by following the I-ATONIS tutorials. There are 35 tutorials on OSC's ATONIS/AAPS website: atonis.osc.uscg.mil.
- The OSC Help Desk is ready and waiting for your I-ATONIS help questions.
- OSC has been practicing the migration of data from ATONIS to I-ATONIS to ensure all will go smoothly when we are ready to deploy.
- Finally, several districts participated in formal testing of the application ("BETA" test) – and all districts will be participating in the next phase of testing, Operational Test and Evaluation (OT&E).

We know that oan staffs are becoming familiar with I-ATONIS and we are not anticipating any surprises!

The AAPS 5.0 application is also a stable product. The application will run on SWIII Panasonic Toughbook rugged portable positioning computers. The AAPS 5.0 application is now at ELC to test the loading and deployment to field process. Loading AAPS 5.0 is a little more complicated than loading AAPS 4.4. ELC must manage a process that loads the standard image, the application, and AtoN data, and make sure that it works perfectly for all AtoN units – no small feat! ELC is working on perfecting this process right now.

Our next major milestone is OT&E. We are also working on a "day-by-day" transition schedule so oan staffs and AtoN units will know what to expect each day while ATONIS/AAPS 4.4 make the final transition to I-ATONIS and AAPS 5.0.

Please call me at (703) 313-5813 or Dave Amburn at (703) 313-5820 with any questions.

I-ATONIS Training Report

by BM1 Brian Myers, NATON School

District Training

BM1 Chris Lucas and I primarily instruct the Aids Positioning course at TRACEN Yorktown. We usually instruct unit level users on the AAPS/ATONIS program and Coast Guard policies pertaining to positioning AtoN. This January, along with LT Madeleine McNamara and LTjg Adam Buffington, we were asked to travel to the Operational Support Center (OSC) in Martinsburg, WV to instruct district level users on the new I-ATONIS program.

We visited Martinsburg for three days and accomplished a lot in that time. Representatives from most of the district offices were there to learn more about the new system and train other users at their offices. Our focus was to teach them the procedures for entering data into the new system and then extracting the information to create the *Local Notice to Mariners*. We also covered chart corrections, waterways, *Light List* corrections, and system navigation. The students took advantage of the opportunity to ask very insightful questions related to the policy and procedures of the program, some of which allowed us to make changes before implementation.

I would like to thank all those who participated in this. I feel that I learned a lot from it as well. Having no experience at the district, it allowed me to get an idea of some of the aspects of AtoN at their level.

Unit Training

I-ATONIS will not be very different from ATONIS to the unit level user; most of the program updates deal with district user functionalities. Members who have already completed the NATON Aids Positioning course do not need to re-attend the course after I-ATONIS is deployed. Since unit level users won't receive hands-on training before the system is deployed, they won't have the advantage of a classroom environment to run through the program and clear up any questions that may arise. At the district training, a lot of issues were addressed that will ease in the transition from ATONIS to I-ATONIS for both unit and district level users, but most of the issues apply mainly to the district users. Without your help, any unit-specific problems may not be found until after I-ATONIS is up and running. Take advantage of the time before deployment to get on the system, navigate through the screens, do the tutorials, and report any problems to NAVCEN. The system is in test mode and the information will be reset before deployment, so you can make any changes you want to until then. You can access the test website at iatonis.uscg.gov and helpful tutorials at atonis.osc.uscg.mil. We recommend that unit level users review tutorials 1, 6, 23, 26, 28, and 29.

Removing Ice from Buoy Hulls With a Pressure Washer

by BM1 Joe Toth, USCGC WILLIAM TATE (WLM 560)

In addition to the seasonal aids that are relieved each year in the Chesapeake Bay and Delaware River, WILLIAM TATE is responsible for monitoring 64 lighted aids on the Delaware River that are subject to removal or relief once they are endangered by ice. As ice develops on the river, it begins to impact the aids on the upper reaches of the river as moving brash is forced onto the top of the hull by the current where it is compressed and often re-freezes inside the cage. In the open waters of the upper bay, a more seamless apron of ice forms gradually on the buoy body and cage as a result of the aid's motion and the added weight of ice accumulation. Each of these situations degrade or endanger the aid in the water and also affect the aid's center of gravity; the servicing unit has to remove some or all of the ice before safely relieving the summer hull. After spending hours at a time during last year's ice season manually removing ice from buoys with pikes, axes, sledge hammers, and fire hoses we knew there had to be a better way of doing business.

We became convinced that combining hot water with high pressure would significantly reduce the time spent clearing ice from each buoy while reducing the effort and risks associated with our manual methods. After researching a few different options during the "off season" we found our Hot Water Steam Pressure Washer: a Landa model SDHW5-30824E, under GSA contract. A 15 horsepower diesel engine runs the pressure washer turning a 2,000-watt generator that runs the burner and provides steam. The generator also provides an auxiliary outlet for 120-volt AC.

The pressure washer can be used as a 3000 psi pressure washer, provide steam at 260°F, or combine both features. It weighs approximately 900 pounds and is housed in a stainless steel cage that is forklift compatible and can be craned on and off of the ship and securely griped on deck. The machine is totally self-contained with the exception of a water supply. The feed for the system needs to be approximately six gallons per minute, which we supply through a hard pipeline from the ship's firemain on the

buoy deck. It was designed to use potable water, but the manufacturer confirmed that we could use saltwater with only a minor reduction in the expected life cycle of the pump.

Although this year's ice season was short lived, we did get a chance to try out the steam pressure washer on a few aids and were extremely pleased with the difference it made for us. In general, using this system reduced the time spent clearing ice from hours to minutes; some aids were ready to come aboard in only 15 minutes. Just as importantly, we kept fewer people hanging over the side and still removed the ice effectively. We used a telescoping pressure washer wand outfitted with either a 0-degree or 15-degree tip. The wand is long enough to reach down to the buoy hull so crewmembers do not have to lean over the side. The high-pressure steam quickly cut through large sections of the ice, which allowed the crew to push it off the hull with a pike or boat hook. When we put the wand into the center of the ice, the steam to quickly melted the ice where it had adhered to the hull and quickly softened the entire block.

LED Lanterns – A Position Report

by CAPT Larry Jaeger (ret), Commandant (G-SEC-2A)

Over the past few years the Coast Guard has procured, installed, and tested an assortment of LED lanterns. Most of the LED lanterns in the field are used with our standard solar panels and batteries. Included in this group are lanterns manufactured by Vega, Zeni, API, and Tidelands. We're also using an LED lantern on ice buoys, made by Sabik, which is powered by a primary battery. Another type of LED lantern, typically referred to as a self-contained lantern, integrates the light, solar panels, and battery into a single package. Most of the self-contained LED lanterns in the field are made by Carmanah, but there are a small number in the field made by other manufacturers.

Carmanah 702 lantern

The benefits of using an LED light source as opposed to a traditional incandescent source are undeniable. LEDs consume less energy, they last longer, they are more rugged, and they do not have to be serviced as frequently as incandescent lamps. Five years from now the majority of our minor aids will use LEDs.

The Ocean Engineering Division (G-SEC-2), working with the Short Range Aids to Navigation Division (G-OPN-2), put together a plan for the development of LED hardware that will replace 90% of the red and green 155mm lanterns. This article describes some aspects of the plan.

Let's start by addressing lighted buoys. In putting together the plan, one of the first choices that needed to be made was choosing between a lantern that uses an outside power source (i.e. standard solar panel and battery) and a self-contained lantern. For a variety of reasons including life-cycle cost, routine servicing factors, and discrepancy response factors, we decided to pursue a self-contained lantern for sites with sufficient solar radiation and for aids with manageable duty cycles. We project that the vast majority of our floating aids will use a self-contained LED lantern. Aids that are not candidates for a self-contained lantern (primarily high duty cycle aids in areas with limited daylight hours) will use an LED lantern with a legacy power system. At this time, we are focusing our efforts on red and green LED lanterns. White and yellow LED lanterns will likely be pursued in the future as LED technologies evolve.

In our buoy-centric world we sometimes forget that we have many more 155mm lanterns on fixed aids than we have on buoys (the ANTs don't forget). We have about 4750 lighted buoys versus 8780 fixed aids with 155mm lanterns. Although the economics and servicing factors are not as compelling for fixed aids as they are buoys, we are pursuing a self-contained LED lantern designed specifically for fixed aids. The big difference between the self-contained buoy lantern and the self-contained fixed-aid lantern will be the solar panel configuration.

As we look ahead to the conversion there is much enthusiasm. Servicing units embrace the idea of self-contained lanterns. But as we plan the conversion, we must be mindful of the needs of the mariner. One of the big challenges is to develop a self-contained lantern that does not reduce the service we provide to our users. Considering that background lighting ashore only gets brighter, we generally need to replace our 155mm lanterns with LED lanterns of equal or greater intensity. The self-contained LED lantern we're targeting will have an effective intensity (40 candelas for a Fl 4) that is equivalent to a red 155mm lantern with a 1.15-amp lamp or a green 155mm with a 0.77-amp lamp. As a point of comparison, the Carmanah 700-series lanterns have an effective intensity of 17 candelas for a Fl 4 signal. Carmanah 700-series lanterns have been procured to replace red and green 155mm lanterns with 0.25-amp lamps. But due to intensity considerations, units are not authorized to replace 155mm lanterns (lamp size 0.55 amp or greater) with Carmanah lanterns unless directed to by District.

The timeline for the development of these self-contained lanterns, like any government procurement timeline, is longer than we want. Specifications are being written now; we're looking ahead to contract award in September, with initial deliveries of demonstration quantities in the summer of 2006. Presuming our early experience with these new signals match expectations, further conversion rates will depend on the availability of funds. Be patient. Good things are coming.

Solar Design Spreadsheet and Solar Sizing Tables

by Mr. Jon Grasson, Commandant (G-SEC-2A)

There have been some questions regarding perceived differences between the solar sizing tables published in the Solar Design Manual, COMDTINST M16500.24 and the Solar Design Spreadsheet Program (Sol Des Ver 3.0). One is actually a product of the other. The Solar Design Spreadsheet Program was developed in the mid-1990s to replace an earlier solar sizing program. The Solar Design Spreadsheet Program was then used to construct the Solar Sizing Tables that are in the Solar Design Manual. For a given aid, someone using the Solar Design Spreadsheet Program can often find several acceptable panel/battery solutions. For example, the program shows that a buoy in Boston with a Fl 4 characteristic and a 0.55-amp lamp will work with either a 20-watt panel and 100-Ah battery *or* a 10-watt panel and a 200-Ah battery. The Solar Sizing Tables list the *optimal* designs. The first place to look for a solution should always be the tables.

If you have any questions regarding solar designs in your OPAREA, send a copy of your spreadsheet or specific details about the aid to your Training Team Chief or anyone on my staff (accessible via www.uscg.mil/systems/gse/gse2) for a recommendation on how to power that aid.

Programmable Flashers

by Mr. Jon Grasson, Commandant (G-SEC-2A)

As many of you are aware, the CG-493 programmable 12-volt flasher is the only low power (less than 50 watts) flasher available from ELC. Use of this flasher allows you to reduce your inventory of discreet rhythm flashers because any standard rhythm can be programmed into the CG-493 flasher. However, some of the flash rhythms are similar, but have different duty cycles. Why is this a cause for special attention? Because the duty cycle for each rhythm is different. A Fl 4 (0.4) has a 10% duty cycle and a Fl 4 (1) has a 25% duty cycle (a Fl 4 (0.4) has a 0.4-second on-time during a four-second period and the Fl 4 (1) has a one-second on-time during a four-second period). The Fl 4 (1) consumes more than twice the power of a Fl 4 (0.4). If your solar sizing is based on a Fl 4 (0.4) rhythm it will fail if you program the flasher to emit a Fl 4 (1) rhythm. This has already occurred at a few sites.

The flash rhythms likely to be confused are: Fl 2.5 (0.3) and Fl 2.5 (1); Fl 4 (0.4) and Fl 4 (1); and Fl 6 (0.6) and Fl 6 (1). Check your aid folder to determine which characteristic is correct for the aid and program the proper rhythm in the flasher. The bottom line is ***you must program the correct rhythm or the aid will likely fail prematurely***.

Why does the CG-493 flasher have one-second on-time rhythms that are similar to our standard rhythms? A high wattage light using a high wattage flasher (e.g. a 300mm with 110-watt lamps) might need an emergency light with the same one-second on-time rhythm. The programmable flasher can match that rhythm. An AC Flash Controller flashing 1000-watt lamps needs a flasher with a one-second on-time. The programmable flasher can be used in the ACFC to flash these larger lamps and meet the minimum flash length. Finally, the one-second on-time slightly increases the nominal range, so if District is trying to achieve the farthest range without changing the lamp size, they could use a longer on-time.

If you need assistance, contact your Training Team Chief, the NATON School, or the Ocean Engineering Division (G-SEC-2A).

CG-493 Programmable Flasher

Table of Programmable Flash Characteristics

Dual and Tripod Solar Panel Mounts on Buoys

by Mr. Jon Grasson and CAPT Larry Jaeger (ret), Commandant (G-SEC-2A)

Ingenuity is the mother of all invention. Years ago when our standard power package on buoys failed to generate enough power or birds hampered power production, cutters came up with ingenious methods of mounting additional solar panels. Tripods and dual panel mounts began sprouting on top of buoys and using More's Law: if a little bit is good, more is better, and too much is just right. These multi-panel arrays seemed to solve the power problem. However, our solar design program only evaluated south-facing panels, so we scrambled to find a method of predicting power production from these multi-panel arrays. We ultimately received some "rules of thumb" from one of our solar panel vendors and published them in the Solar Design Manual, COMDINST M16500.24.

We recently acquired new solar sizing software that allows in-house evaluation of all combinations of panel orientations. The old rules of thumb will be replaced by factors specifically calculated for each solar data site. Here are some of the new multiplication factors for sites most likely to need dual or tripod solar panel mounts. So, how do you use these factors? Select the data site near the aid and enter the appropriate data into the

Data Site	Tripod 60°	Dual 45°	Dual 15°
Portland, ME	1.5	1.0	1.4
Boston, MA	1.5	1.0	1.4
Providence, RI	1.5	1.0	1.5
Bridgeport, CT	1.5	1.0	1.5
New York, NY	1.6	1.0	1.5
Albany, NY	1.7	1.1	1.5
Burlington, VT	1.7	1.1	1.5
Newark, NJ	1.6	1.0	1.5
Atlantic City, NJ	1.6	1.0	1.5
Wilmington, DE	1.6	1.0	1.5
Philadelphia, PA	1.6	1.1	1.5
Baltimore, MD	1.6	1.0	1.5
Sterling, VA	1.6	1.0	1.5
Norfolk, VA	1.5	1.0	1.5
Cape Hatteras, NC	1.6	1.1	1.5
Wilmington, NC	1.6	1.1	1.5

Data Site	Tripod 60°	Dual 45°	Dual 15°
Charleston, SC	1.6	1.1	1.5
North Bend, OR	1.6	1.1	1.5
Astoria, OR	1.6	1.0	1.5
Portland, OR	1.8	1.2	1.6
Pendleton, OR	1.6	1.1	1.5
Quillayute, WA	1.5	1.0	1.4
Seattle, WA	1.7	1.1	1.5
Annette, AK	1.5	0.9	1.4
Yakutat, AK	1.4	0.8	1.2
Anchorage, AK	1.4	0.7	1.1
Kodiak, AK	1.3	0.7	1.2
Cold Bay, AK	1.6	1.0	1.4
King Salmon, AK	1.3	0.7	1.1
Bethel, AK	1.3	0.7	1.1
Nome, AK	1.2	0.6	0.7

Solar Design Program. The tilt angle should be same as the installed panel angle; e.g. a tripod mount will have a 60-degree tilt angle. The entry for the array size must be calculated using the above factors. So, for a 20-watt tripod array in Baltimore, the array size is 1.6 x 20 watts = 32 watts. For now, use the recommended battery size. Arco/Siemens/Shell 35-watt solar panels should be entered as 40 watts because it is closer to the true output.

Note that some of the factors are higher than previously published and some are much lower. The values for a dual, 45-degree mount are much lower than the 1.6 factor that appeared in the Fall 2004 issue of The Bulletin (Dual Solar Panel Mount by BM1 S. Worrell; p. 18). This table will be expanded to cover all of the standard Coast Guard solar radiation sites and published in the Solar Design Manual. Please contact Mr. Larry Jaeger at LJaeger@comdt.uscg.mil or (202) 267-1859 with any questions.

BMCM Mark Schweiger to Retire . . . Again

by LTjg Adam Buffington, NATON School

After many years in the Coast Guard (no one's quite sure how many) and one retirement under his belt, Master Chief Schweiger will go on terminal leave in the spring. Master Chief has truly been a wealth of AtoN and Coast Guard knowledge in service to his country, but his mind's bound to turn soft soon. Some say he's 60 years old, some say he might be 70; but if you ask me I say he must be 104 if he's a day. He looks forward to slowing down from the swift pace of his cushy desk job at NATON and refocusing the mental energy he usually spends harassing junior officers into his redneck hobbies. Luckily, the AtoN community won't miss a beat with Master Chief's departure because the school has already found a comparable successor. The new recruit has a big chair to fill, but he seems to be well on his way.

BMCM(sel) Charlie Premo

We'll miss you Master Chief.

14-inch Range Lanterns, Beam Widths, Spread Lenses, and Lamps: Part 1

by CAPT Larry Jaeger (ret), Commandant (G-SEC-2A)

In December 1991, a fishing boat sank near the entrance to one of our West Coast harbors. The vessel ran aground after the operator failed to correctly negotiate the turn from one channel into a second channel. Both channels were marked by range lights. All three men aboard went into the water; two were recovered by another fishing boat but the operator lost his life.

The family of the man who died sued the United States and hired an expert witness to review the status of our AtoN and marine information. The expert witness "drafted a devastating thirteen-page report detailing numerous acts and omissions." This is one of many documented problems related to the hardware configuration of the 14-inch range light and associated "beam wander." The Government settled out of court for $200,000. The man's body was never found.

Initial Range Design

A 14-inch range lantern is like a spotlight or flashlight in that it produces a beam of light that is directed in one direction. The width of the beam can be changed by installing different spread lenses. Let's begin by addressing how beam width figures into the initial range design.

The Coast Guard has a Range Design Program that is used by Districts and CEUs to choose locations, heights, and intensities for front and rear range lights, but it provides no help in determining beam width requirements. Beam widths are generally selected by looking at where the mariner needs to acquire the light signal at the far end of the channel. Consider the situation shown in Figure (1). Because the beam is so narrow, the mariner does not acquire the range lights until he's almost "on" the new range. If his ship has a lot of advance and transfer he will have to initiate his turn before he sees the range lights.

Figure (2) shows the same section of waterway but with range lights having a wider beam. In this case, the mariner acquires the lights early and is able to use them to help initiate his turn.

Beam width selection is just as important as lamp size selection. Beam width, lamp size, light characteristic, and light color all factor into the calculation of a light's effective intensity.

An appropriate spread lens on a 14-inch range lantern will produce a desired beam width. The spread lens required for a specific light is specified in the District-prepared CG-3213 when a light is established or when changes are made. District also enters the required spread lens data in the "Lantern" field in ATONIS and makes appropriate entries in the "Remarks" section of the *Light List*.

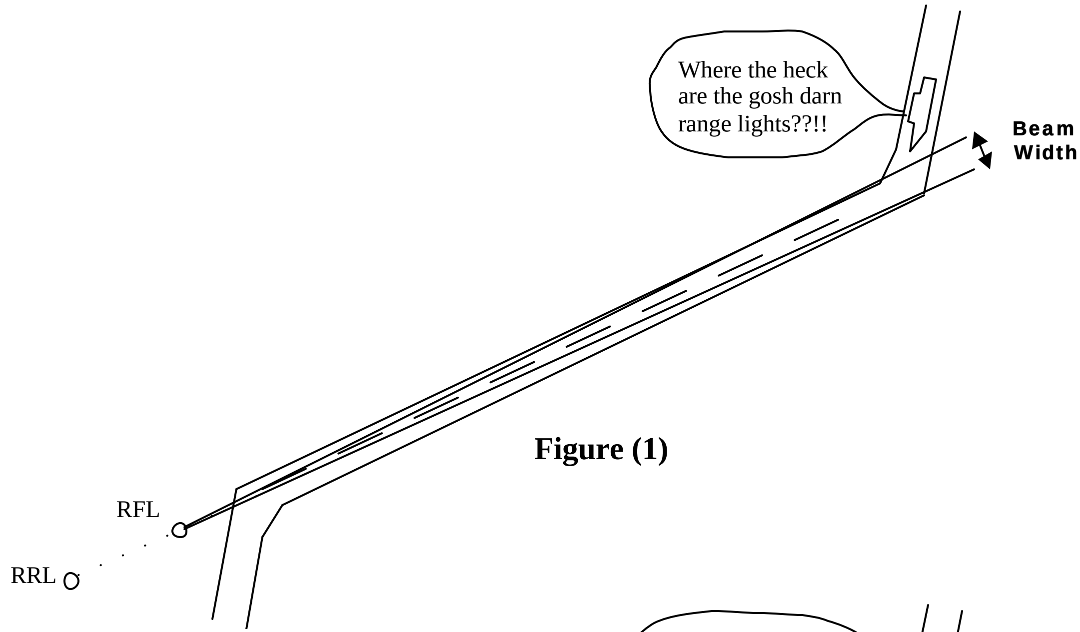


Figure (1)

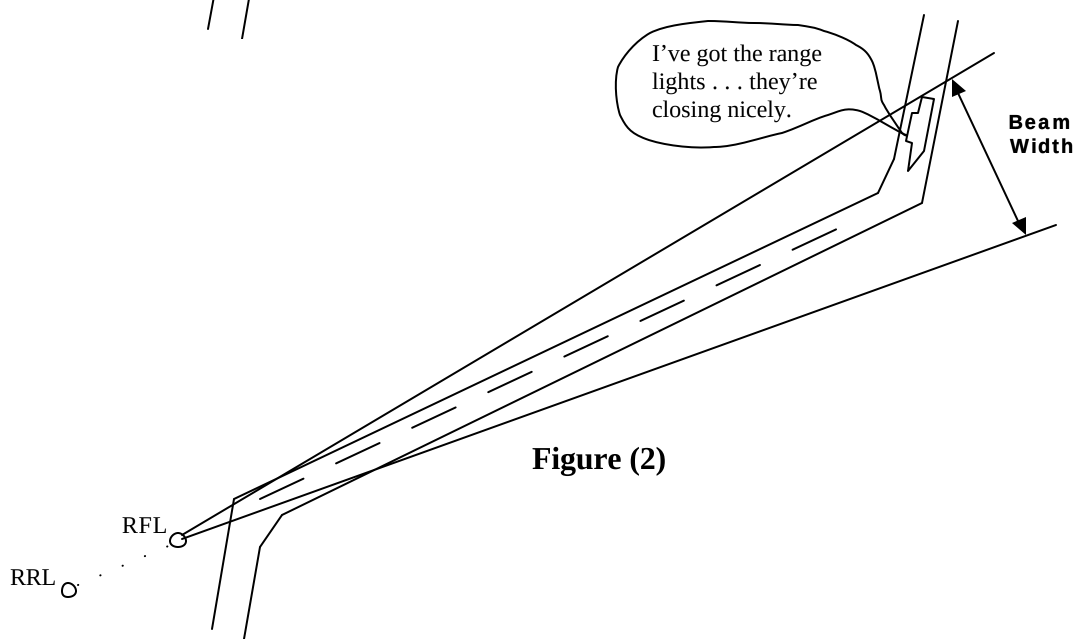


Figure (2)

ATONIS Entries

District enters spread lens data into ATONIS by entering an appropriate entry in the "Lantern" field. Choices in the pull-down menu are:

RL14	RL14-20DEG
RL14-3DEG	RL14-28DEG
RL14-8DEG	RL14-30DEG
RL14-11DEG	RL14-SPRD

"RL14" is the correct choice if there is no spread lens. The 3-degree, 8-degree, 11-degree, 20-degree, and 28-degree choices are self-explanatory. "RL14-30DEG" is a terrible choice becasue there has never been a 30-degree spread lens for an RL14 and "RL14-SPRD" isn't much better because although it conveys the need for a spread lens, without a specified beam width the hardware requirements are not clear. The "RL14-30DEG" option will be removed from the list in I-ATONIS.

Light List RL14 Remarks Entries

The information conveyed to the mariner via the *Light List* varies by District. Most Districts typically provide beam width information by indicating how far off the rangeline the beam can be seen (e.g. "Visible 4° each side of rangeline"). One District uses "Visible on range line only." Another District generally chooses to include no information about beam width in the Remarks section.

In a future change to the AtoN Manual – Administration, COMDTINST M16500.7A, Commandant (G-OPN) will provide guidance that will standardize *Light List* Remarks Section entries for directional range lights. The standard will be "Visible X° each side of rangeline" where X is ½ the beam width.

Hardware

It's time to reach out and touch the servicing personnel. Let's talk hardware.

A new RL14 from ELC is delivered with a flat glass cover plate. The flat plate is sometimes called a ***0-degree spread lens*** because it does nothing to spread the light that is reflected off the parabolic mirror at the back of the drum. Used with an ***authorized*** lamp, an RL14 with a flat glass cover has a beam width of about 1 degree (very narrow indeed!). Spread lenses come in 5 sizes: 3-degree, 8-degree, 11-degree, 20-degree, and 28-degree. ELC does not stock spread lenses – units may procure them directly from Tidelands from their GSA contract for $173.57.

3-degree, 8-degree, and 20-degree spread lenses are flat on one side and have "ridges" on the other side. 11-degree and 28-degree spread lenses have ridges on both sides. The spread lens replaces the flat lens that comes with a new RL14. 3-degree, 8-degree, and 20-degree spread lenses can be installed with the "ridges" facing either in or out; however, the preferred method is with the flat side facing in for maximum self-cleaning due to environmental factors. The degree of spread is written on the lens, but unfortunately the writing is hidden from view when a lens is installed – a field unit trying to confirm the size of a spread lens in an existing optic must remove the lens from the optic to see the writing. This can be problematic because removing the lens may compromise the optic's weather seal (a gasket). However, if the unit has any doubt about a lens's degree of spread then there is no choice – just be sure to have a spare gasket in case the old gasket needs to be replaced.

More information on RL14 lanterns and spread lenses is in the following references:

AtoN Manual – Technical, COMDTINST M16500.3A
AtoN Visual Signal Design Manual, COMDTINST M16510.2A
Short Range AtoN Servicing Guide, COMDTINST M16500.19A
NATON RL14 presentation (send requests to BM1 Lee McMillan at LMcMillan@tcyorktown.uscg.mil or (757) 856-2632)
Instructions included with lanterns

Unauthorized Lamp/Lens Combinations

***This is the most important part of this article*:** remember the fishing boat that sank when the operator failed to correctly turn on to the next range? At the time of the accident the front range light had a single-coil (C-8), tungsten-filament marine signal lamp and the 14-inch range lantern had a flat cover plate (i.e. there was no spread lens). **THIS IS AND ALWAYS HAS BEEN AN UNAUTHORIZED COMBINATION** per the AtoN Manual – Technical and the AtoN Visual Signal Design Manual. The filament size on all C-8 marine signal lamps is too small to be used with an RL14 that does not have a spread lens. Without a spread lens there is poor coupling between the C-8 marine signal lamp and the optic, and the result is a very narrow light signal that can "wander" off in any direction.

The following standard marine signal lamps are all single-coil (C-8) lamps that should ***not*** be used in an RL14 without a spread lens: 0.25-amp, 0.55-amp, 0.77-amp, 1.15-amp, 2.03-amp, and 3.05-amp lamps. Lamps that can be used without a spread lens include the 1.0-amp, 1.9-amp, 3.0-amp, 35-watt, 50-watt, 75-watt, 100-watt, 110-watt, 150-watt, and 250-watt lamps.

What should I be doing?

District office:

1. Work towards ensuring that every range has a complete range analysis, including a range design per the Range Design Manual, COMDTINST 16500.4B and a proper determination of user needs for beam width on directional range lights.

2. Properly document hardware that is needed to meet operational requirements. Specifically, the ATONIS "Lantern" field should specify what spread lens should be used on every directional range light.

3. Change every ATONIS "RL14-SPRD" lantern entry to an entry that specifies the degree of spread.

4. Make sure that the *Light List* has an appropriate "Remarks" entry for directional range lights.

Servicing units:

1. Know – for certain – what spread lens District wants on every directional range light. What did District enter in ATONIS? What's in the aid folder? What's on the CG-3213? What's in the "Remarks" section of the *Light List*? Does everything match? If there is any doubt, contact District ASAP.

2. Ensure that the hardware specified by District is really on the aid. If District has clearly specified a specific spread lens, ensure that the right lens is installed. This may require pulling out an existing spread lens to check the writing, but that's the cost of doing the job right.

3. *Really* compare what's on the aid to what's in ATONIS, what's on the charts, and what's in the *Light List*.

4. Finally, confirm that every one of your RL14's with a C-8 marine signal lamp also has some type of spread lens.

In Part 2 of this article, I'll address factors associated with acquiring range lights at the *near end* of the channel.

In the meantime, further information on this subject is available to Coast Guard personnel who have responsibilities in this area (both at the district and servicing unit level). If you are one of those Coast Guard members, you're encouraged to check out this additional information that has been posted on the Ocean Engineering Website at cgweb.comdt.uscg.mil/g-sec/sec/2. Click on "Products/Services" in the left-hand column and then look under the Signal and Power Team heading. The information is only available to Coast Guard members accessing the site via the Coast Guard *Intra*net.

Free AtoN Hardware!!

by ET1 Jeff Shield, ELC

The Short Range Aids to Navigation Section (SRAN) of the ELC Lab has three excess ELG-300 long-range sound horns in good condition. The horns are made of cast iron and weigh more than 300 pounds. ELC tested each horn found them fully functional.

Please contact me at JShield@elcbalt.uscg.mil or Jeffrey.C.Shield@uscg.dhs.gov or (410) 762-6028 if interested.

Solar Lighthouse Programmable Flashers

by ETC Roger Stephens, NATON School
with contributions from Mr. Jon Grasson and Mr. Kam Agi, Commandant (G-SEC-2A)

CG-493 Programmable Flashers

MES Programmable Flasher

If you have had emergency signal control problems using C-R programmable flashers at your Solar Lighthouse, good news is on the way. It's not that there is a problem with the flashers; it's really an incompatibility issue relating to C-R's (CG-493) new circuit designs. For years techs in the field were instructed to use a C-R made flasher for use in the emergency light at Solar Lighthouses. The Ocean Engineering Division (G-SEC-2) was taking advantage of C-R's method of biasing the input to the DLC terminals (the two "S" terminals), which works well with the method of control (by SACII TB1-10). However, when C-R developed the programmable flashers for the Coast Guard, they unexpectedly reversed the way the old DLC circuit worked.

The simplest solution for now is to use ACSI-built programmable flashers; the internal DLC circuit still operates the old way. You still need the 6,800-ohm biasing resistor between the two "S" terminals. The SACII replacement should be available sometime this year, and will conveniently be named SACIII. The SACIII will contain two additional terminals on TB2 (called TB2-4 and TB2-5) that are dedicated for emergency signal control at solar lighthouses (no more worries about whether you're using the right flasher). SACIIIs will do everything a SACII can do (and more) and will simply replace SACIIs over time as they age and fail (if they fail). The SACIII is simply a step forward in the natural evolution of the Solar Aid Controller.

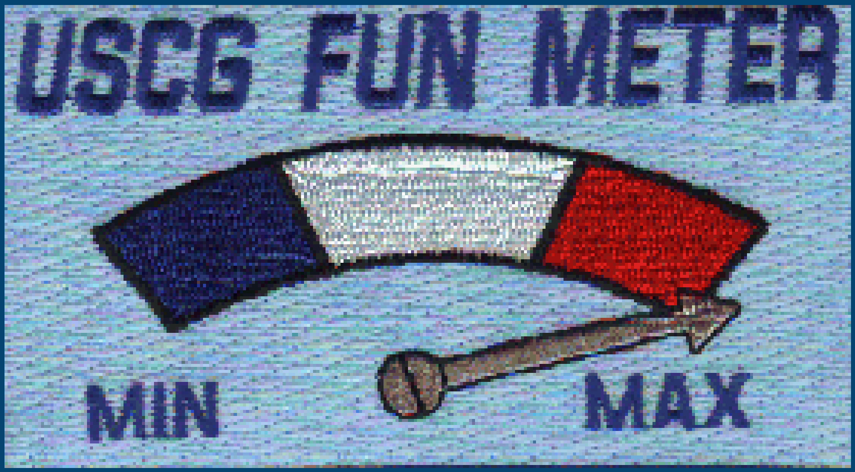
For further information visit the Ocean Engineering Division (G-SEC-2) web site at www.uscg.mil/systems/gse/gse2.

Buoy Tender Word Search

J U V H T S K A N E Q A F I P S B H O W I W X U O
M C W O M T A G Y Y H F U I J T A G I W D J S N O
I F V L I C T I V E E N T D Q F R I P P A I U N L
U B G L N A H S H T N M V C N P B Q N R L Z Y S B
L P C Y O G E T U L R E X T Q F A N J F E L Z P C
D L C H S F R S D X Y K K F L I R H L P W V K H C
W Z B O E R I M K V B O A K R F A B V M I R V X W
A O F C R A N M L N L U F I J M M P P A S I V D P
L X H K F N E M C R A J A W T J A V T P E R S R P
N A C V D K W O Z W K O U L Z G B J L L B H Y H P
U D U A C D A N N L E S B C N Z R X C E G Z C J E
T J T V I R L T P Y J H F I R K I U B B P W A S L
C J B I W E K B Z M C U V Q A C T I N X M X M R M
W P J F R W E W T Y J A I H B N Y Z J I A B O F E
L S Q I L M R I Y X W A W A B H T J A N R U R J X
G D C N J O U L S H U P U B I H J S M P C F E O M
I A N B N A V L J G O P R M E Z X S E E U O U Y I
F V Z F M Z I O U R V L D B B Z S L S R S K D D P
S G L J E W C W N L Z E R V U C X R R Q H K V N U
Q W C I W N R B I R I B U O R O U W A Z A G F X S
J H S I R O Z T P D G Y Y X G J L E N O N A Y O I
Q N P M N P O B E O X L G E E S Q B K P N J N J M
K F D K J R B Y R R D B V L S B Z U I N A V N T X
G N K U K U I H M Q U F D R S Z A X N S P A R J R
G F N N T F M P R D O C T V W E V Y S X W Q Q M B

Word List

ABBIEBURGESS	HENRYBLAKE	JUNIPER	OAK
BARBARAMABRITY	HOLLYHOCK	KATHERINEWALKER	SPAR
ELM	IDALEWIS	KUKUI	SYCAMORE
FIR	JAMESRANKIN	MAPLE	WALNUT
FRANKDREW	JOSHUAAPPLEBY	MARCUSHANNA	WILLOW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